

THE TAXONOMIC STATUS OF THE PREDACEOUS MIDGE
PACHYHELEA PACHYMERA (WILLISTON)
(DIPTERA: CERATOPOGONIDAE)

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Abstract.—The taxonomic status of the monotypic genus *Pachyhelea* Wirth is reviewed, and the genus is compared with its nearest relative, *Palpomylia* Meigen. The sole member of this genus, *Pachyhelea pachymera* (Williston), is illustrated for the first time, and the male genitalia are described in detail.

While preparing a revision of the Nearctic species of *Palpomylia* Meigen, we have compared species of that genus with that of a close relative, *Pachyhelea* Wirth. Although *Pachyhelea pachymera* (Williston) is known from both sexes, the male genitalia have not yet been described in detail, and this species has not been illustrated. We take this opportunity to illustrate the species and to review its taxonomic status.

For an explanation of terminology dealing with general ceratopogonid morphology see Wirth (1952); terms dealing with male genitalia are those of Snodgrass (1957). We are grateful to Niphan C. Ratanaworabhan for preparing the illustrations.

Wirth (1959) proposed the genus *Pachyhelea* and selected *Ceratopogon magnus* Coquillett as its type-species. He indicated that *C. magnus* was a synonym of *Ceratopogon pachymerus* Williston, but he did not designate the latter species as the type-species of *Pachyhelea* because the holotype of *C. pachymerus* was aberrant in having a wing with only a single radial cell. Wirth also listed two other names as synonyms of *P. pachymera*, *Sphaeromyias albidiventris* Kieffer and *Johannsenomyia latifemoris* Ingram and Macfie.

It is not surprising that there are so many synonyms for *pachymera* in view of the fact that it is one of the most widespread ceratopogonids inhabiting the New World. This species ranges from the lower Rio Grande Valley

of southern Texas south through Mexico, Central and South America to at least as far south as Buenos Aires, Argentina.

In comparing *Pachyhelea pachymera* with species of *Palpomyia*, we were impressed with its resemblance to members of the *tibialis* group of *Palpomyia* as defined by Grogan and Wirth (1975). A phylogeny of *Pachyhelea* and the species groups of *Palpomyia* is presented in Fig. 2. *Pachyhelea* is the sister group of *Palpomyia*, differing from the latter by four apotypic character states. *Pachyhelea* and the *tibialis* group of *Palpomyia* share at least two plesiotypic character states, the recurved tips of the male claspettes and setae on the ventral surface of the fifth tarsomeres. The setae of the fifth tarsomere may be vestiges of batonnets, which are present in the Sphaeromiini and may indicate a sister group relationship. A problem exists with the phylogeny presented in Fig. 2 in that the apotypic state of character 5 (spinose femora) is not universal (synapotypic) for *Palpomyia*. A few members of the *tibialis* group lack femoral spines. Those species which lack femoral spines are obviously not of the *Pachyhelea* branch because they lack the four apotypic character states of the genus. Thus, *Palpomyia* may be paraphyletic and require subdivision into two or more genera. A detailed study of the numerous and diverse Neotropical *Palpomyia* species is badly needed and may provide answers to this problem.

Genus *Pachyhelea* Wirth

Pachyhelea Wirth, 1959: 50. Type-species, *Ceratopogon magnus* Coquillett (original designation) = *pachymera* (Williston).

Diagnosis.—A genus of predaceous midges of the tribe Palpomyiini most closely resembling *Palpomyia*, differing from all other ceratopogonid genera by the following combination of characters: Abdomen of female with 1 pair of eversible glands and internal sclerotized gland rods and 2 spermathecae; wing with 2 radial cells and costa extending to 0.80 or more of wing length but not to tip; femora without strong ventral spines. Most species of *Palpomyia* have strong ventral spines on the fore femur, although some lack spines on all their femora. *Pachyhelea* differs from all species of *Palpomyia* by the greatly swollen hind femur, enlarged quadrate hind coxa, tuberculate scutum and scutellum, and scutellum lacking bristles.

Pachyhelea pachymera (Williston)

Fig. 1

Ceratopogon pachymerus Williston, 1900: 224 (♀; Mexico).

Probezzia pachymera (Williston); Malloch, 1914a: 137 (combination).

Pachyhelea pachymera (Williston); Wirth, 1959: 50 (combination; re-described; synonyms: *albidiventris*, *latifemoris*, *magnus*); Lane, 1961: 42 (Brazil records); Wirth, 1962: 275 (in key); Wirth, 1965: 140 (distribution); Wirth, 1974: 53 (distribution); Wirth, *et al.*, 1974: 604 (in list, key).

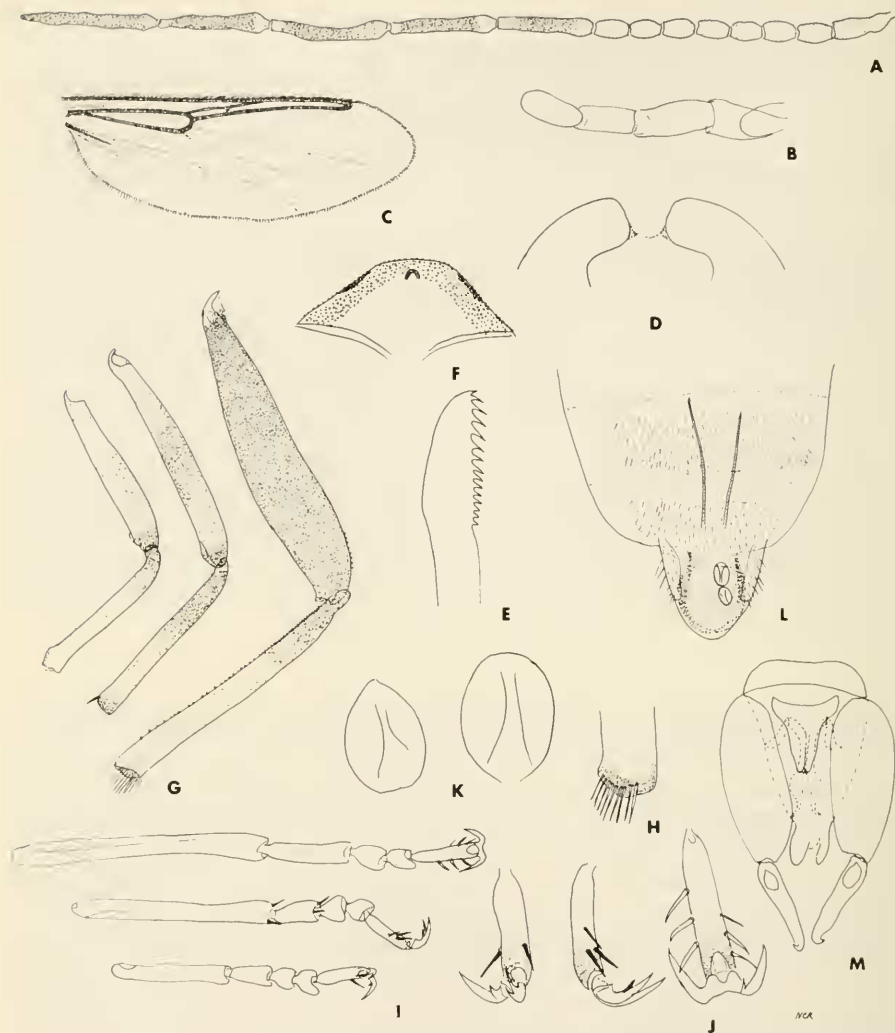


Fig. 1. *Pachyhelea pachymera*. A-L, Female. A, Flagellum of antenna. B, Palpus. C, Wing. D, Intercocular area. E, Mandible. F, Scutum. G, Leg color pattern. H, Hind tibial comb. I, Tarsi. J, Fifth tarsomeres and claws. K, Spermathecae. L, Abdomen. M, Male genitalia.

Ceratopogon magnus Coquillett, 1905: 61 (♀; Texas).

Johannseniella magna (Coquillett); Malloch, 1914b: 227 (in key; combination).

Johannsenomyia magna (Coquillett); Malloch, 1915: 333 (in key; combination); Johannsen, 1943: 784 (in list N. Amer. species).

Sphaeromyias albidiventris Kieffer, 1917: 316 (♀; Colombia).

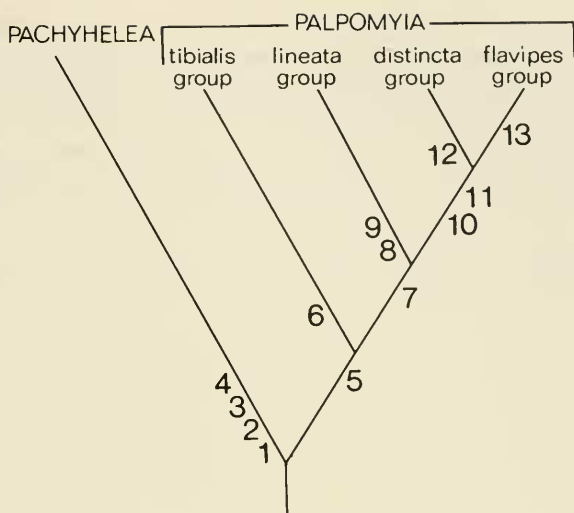


Fig. 2. Phylogeny of *Pachyhelea* and the species groups of *Palpomyia*. Apotypic character states are: 1, Greatly swollen hind femur; 2, enlarged hind coxa; 3, tuberculate scutum and scutellum; 4, absence of scutellar bristles; 5, spinose femora; 6, male genitalia tilted back 45°; 7, claspettes with rounded tip; 8, pupal apicolateral processes with dense covering of small pointed tubercles; 9, basimere with basal setose mesoventral tubercle; 10, head round; 11, absence of setae on fifth tarsomeres; 12, female with lobes on eighth sternum; 13, absence of basal inner tooth on claw.

Homohoelea albidiventris (Kieffer); Kieffer, 1917: 364 (combination).

Johannsenomyia latifemoris Ingram and Macfie, 1931: 231 (♀; Argentina); Macfie, 1940: 75 (description of ♂).

Diagnosis.—Since only one species of the genus is known, its diagnosis is that of the genus.

Female.—Wing length 2.28–2.46 mm ($n = 3$); breadth 0.82–0.86 mm ($n = 3$). *Head*: Yellowish brown, flattened dorsoventrally. Eyes bare, moderately broadly separated (Fig. 1D). Antenna slender; pedicel dark brown; flagellum (Fig. 1A) yellowish on proximal 8 flagellomeres, distal 5 flagellomeres brownish except on extreme basal portions; proximal 8 flagellomeres oval with a central whorl of sensilla chaetica and 3 subapical sensilla trichodea; distal 5 flagellomeres elongated with scattered sensilla chaetica and several pairs of sensilla basiconica; lengths of flagellomeres in proportion of 29-16-15-16-15-15-14-15-50-49-48-45-54; antennal ratio 1.64. Palpus (Fig. 1B) yellowish; lengths of segments in proportion of 11-20-22-14-15; palpal ratio 2.24. Mandible (Fig. 1E) heavily sclerotized; inner margin with 12–15 large coarse teeth.

Thorax: Dark blackish brown. Scutum (Fig. 1F) broad, convex, with a rather short, sharp, conical anterior spine and well developed humeral pits;

scutum and scutellum covered with small setose tubercles; scutellum lacking bristles; postscutellum very highly produced, non-tuberculate but covered with fine pubescence. Fore and mid coxae light brown; hind coxa dark brown, greatly enlarged and quadrate; femora and tibiae as in Fig. 1G; dark brown on most of mid and hind femora, apical $\frac{1}{3}$ of mid and hind tibiae, remainder yellowish brown; tarsi (Fig. 1I) yellowish, tarsomeres 1 and 2 of hind leg and tarsomere 1 of mid leg with well developed palisade setae; 4th tarsomeres cordate or heart-shaped; 5th tarsomeres (Fig. 1J) with 1–3 pairs of stout ventrolateral bristlelike setae; claws equal sized, each with basal inner tooth; hind claws slightly longer than mid claws, mid claws slightly longer than fore claws. Wing (Fig. 1C) hyaline, moderately broad, covered with microtrichia only; anal lobe only moderately developed; costa rather long, extending to 0.80–0.83 of wing length, but not produced beyond tip of vein R4+5; 2 narrow radial cells present, the 2nd over $2\times$ as long as 1st; crossvein very short, barely as long as broad; medial fork broadly sessile, veins M1 and M2 both bowing posteriorly in the middle; mediocubital fork just beyond level of r-m crossvein; anal vein forking at proximal $\frac{1}{3}$ of anal cell with posterior fork proceeding obliquely nearly to posterior wing margin. Halter pale.

Abdomen: Golden brown with a single pair of gland rods (Fig. 1L). Genitalia very similar to those of members of the *tibialis* group of *Palpomyia* as defined by Grogan and Wirth (1975); 10th sternum with 6 pairs of large setae. Spermathecae (Fig. 1K) ovoid, unequal, with very short necks.

Male.—Wing length 1.5–1.9 mm; breadth 0.5–0.6 mm. Generally similar to female but darker and smaller; flagellum dark brown with sparse plume; legs entirely brown, the mid and hind legs darker than fore leg; 5th tarsomeres with fewer ventrolateral setae which are less distinct than in female; claws small, equal sized without basal inner teeth, tips bifid; abdomen dark brown. Genitalia as in Fig. 1M. Ninth sternum $3.75\times$ broader than long, base slightly curved, posterior margin nearly straight; long, extending to apex of basimeres. Basimere slightly curved, about $3\times$ longer than broad with a basal ventral elevated portion; telomere about $0.6\times$ length of basimere, nearly straight with hooked tip. Aedeagus moderately sclerotized, about $1.3\times$ longer than broad, basal arch shallow, about $\frac{1}{8}$ of total length, membrane spiculate but not ventral surface; margins of distal portion wrinkled, tip in shape of narrow crescent; basal arm heavily sclerotized, nearly straight, not recurved. Claspettes divided; each with distal portion moderately sclerotized, slender with subapical scalpel-shaped swelling, then narrowing abruptly to slightly curved, pointed tip; basal arm heavily sclerotized, recurved nearly 90° with a slender pointed tip.

Distribution.—Southern Texas south through Central and South America to Argentina.

Types.—*Ceratopogon pachymerus* Williston: Holotype, ♀, Medellin near

Veracruz, Mexico, Jan. 1898, H. H. Smith, BCA Dipt. 1 (British Museum (Nat. Hist.)). *Ceratopogon magnus* Coquillett: Holotype, ♀, Brownsville, Texas, May, coll. C. H. T. Townsend (Type no. 8359, U.S. National Museum). *Sphaeromyias albidiventris* Kieffer: Type, ♀, Baranquilla, Colombia (Ujhelyi) (in Budapest Museum, presumably destroyed in fire). *Johannsenomyia latifemoris* Ingram and Macfie: Holotype, ♀, San Isidro, Buenos Aires, Argentina, 10 Jan. 1927 (British Museum (Nat. Hist.)).

New Records.—BRAZIL: Amazonas, Rio Solimoes, 13 Aug. 1961, E. J. Fittkau, at light, 1 ♀ with ♂ genitalia attached to abdomen; Amazon River, Patucho Light, Ilha Parintuis, 11 Sept. 1969, H. A. Wright, 1 ♀. PANAMA: Canal Zone, Fort Davis, 20 Aug. 1952, F. S. Blanton, light trap, 1 ♀.

Discussion.—Our description of the male exclusive of genitalia is an abridgement of Macfie's (1940) description of males taken from northeastern Brazil. The description of the male genitalia is based upon genitalia that are attached to the abdomen of the female from Rio Solimoes, Amazonas, Brazil.

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